



# The River Mile

## Water Quality

### Lesson #1

## Water Quality a Global and Local Issue



Developed by the Lake Roosevelt Forum to support "The River Mile" National Park Service Program

**Suggested duration:**  
[90 minutes]

**Inquiry Question:**

What determines water quality?

**Inquiry Process:**

Identify variables  
Develop questions

**Standards:**

LS2 Ecosystems  
LS3 Adaptation

**Pre-Assessment:**

- WQ prior knowledge
- Ability to generate testable inquiry questions

**Materials:**

Science journal  
Computer  
LCD projector

**Handouts:**

Student Handout  
Seattle Times Article  
"Human waste plagues  
Lake Roosevelt, other  
outdoor locations".

Lesson 11  
WQ Research Project  
Requirement & Timeline

**Credits/Citations:**

Adole Douglas, Biology  
Teacher Charlotte, NC  
original pp guidelines  
and research criteria  
which were modified for  
this unit.

**You Tube videos**

**LESSON #1****Water Quality a Global and Local Issue****INTRODUCTION:**

Students think about and discuss water quality (WQ) issues from a global and local context. The unit and culminating research project assessment are introduced. Students are invited to begin thinking about a question that they will turn into a testable inquiry investigation and that puts them into a leadership roll focused on The River Mile site or a community stewardship project.

**STUDENT WORK AND ASSESSMENT**

Pre-Assessment: [10 minutes (m)] Students write everything they already know about factors that impact, alter or are used to measure the quality of water.

**QUESTIONS TO EXPLORE/INSTRUCTIONS/PROCEDURE**

1. View "Water for Life" video (12 m) - <http://www.youtube.com/watch?v=6q9WPXz94LE>
2. What questions arise from watching this video? (15 m)
  - a. Give students time to (5m) quick write (notes, thoughts, ideas & questions)
  - b. Pair Share (2m each) thoughts & questions. Discuss (6 m)
3. (20m) Read and discuss in small groups the 11/07 Seattle Times Article "Human waste plagues Lake Roosevelt, other outdoor locations." As a group, create a Venn diagram comparing & contrasting the global & local water quality issue. Be sure to include prior knowledge from your journals.
4. What new questions arise from the video, article and group discussions? How could you investigate or test a WQ question?
5. Culminating Research project: Intro-Lesson 11 requirements and timeline
  - a. [Optional] View **Water Crisis** - Discuss ideas for making student videos about local water issues as a culminating project. <http://www.youtube.com/watch?v=BkNY78B2Jio>
6. [Optional] African Water Carrying Activity: Go outside and select a water carrying course. Divide into 4-5 teams. Each team is given a towel to use as a head support and a gallon of water. Students race the clock and try to get the most water home to their family.

**RESOURCES:** Lesson 11 Culminating Project Guidelines & Rubric

# WATER QUALITY: A GLOBAL AND LOCAL ISSUE

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**Essential Question:**

What determines water quality?

**Inquiry Question:**

What can be done to provide clean drinking water?

**Objectives:**

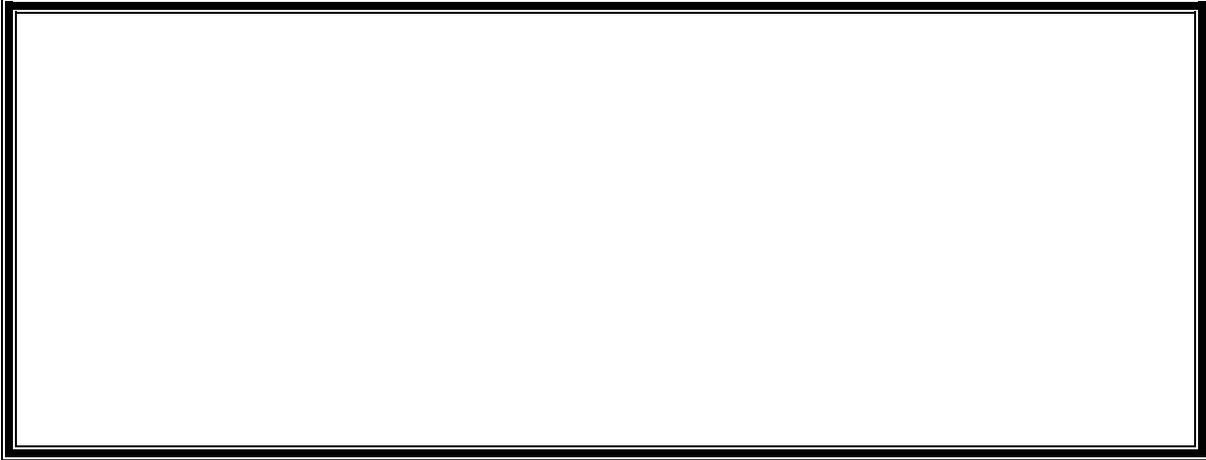
You will:

- Formulate and discuss ideas
- Search for relevant information from a variety of sources
- Begin a Culminating Assessment Project due at the end of the Water Quality Unit

**Think Time:**

**Describe in detail what you already know about...**

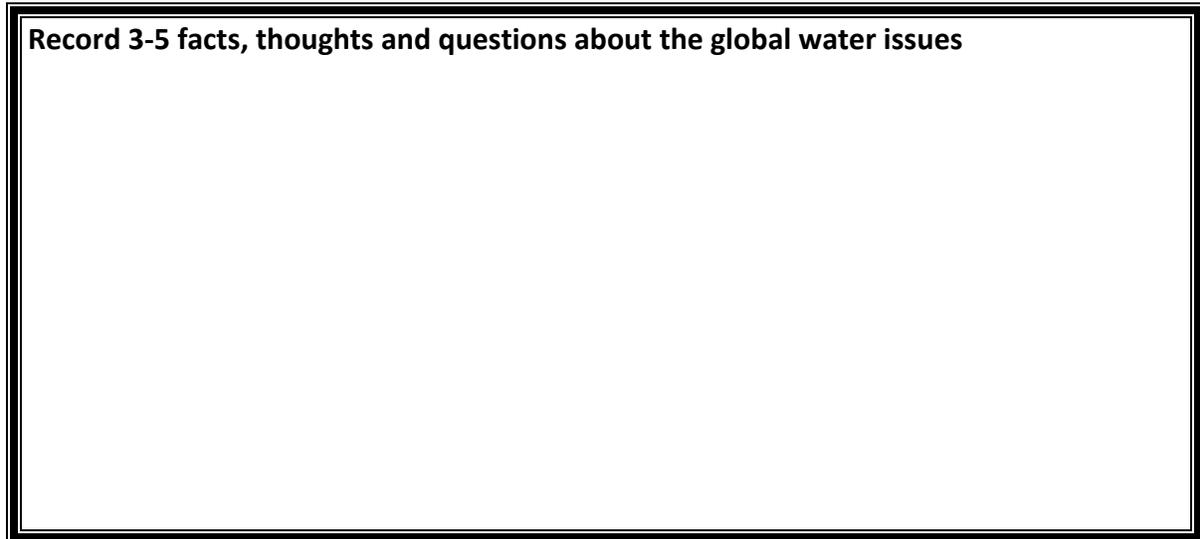
1. factors that impact, alter or are used to measure water quality
  
  
  
  
  
  
  
  
  
  
2. local water issues remember what you have observed at your **River Mile site**
  
  
  
  
  
  
  
  
  
  
3. and global water issues



**View, Listen and Question:**

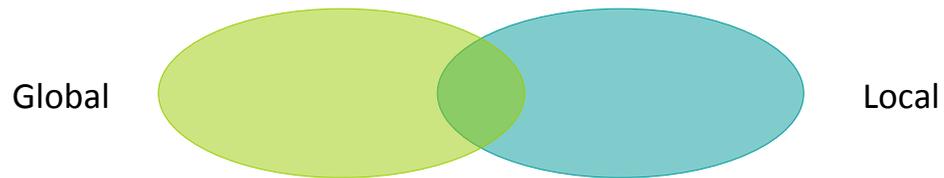
1. Water for Life - <http://www.youtube.com/watch?v=6g9WPXz94LE>

**Record 3-5 facts, thoughts and questions about the global water issues**



2. Share with a partner, (2 minutes each) your thoughts, ideas and questions and then discuss similarities and differences between the local issues and the ones presented in the video. (6 m)
3. **Read and discuss in small groups** the 11/07 Seattle Times Article *“Human waste plagues Lake Roosevelt, other outdoor locations.”*

4. **Create a group Venn diagram** comparing & contrasting the global and local water quality issue. Be sure to include prior knowledge.



**Write three “I wonder...” questions** using ideas from the video, article and group discussions about water quantity and quality. What might be interesting to research or could be useful to the community if an answer was discovered.

I wonder why...
I wonder how...
I wonder what would happen if...

**Continue thinking and wondering as your teacher introduces the Culminating Project which gives you the opportunity to do a local stewardship project at your River Mile. Your project will be completed by \_\_\_/\_\_\_/\_\_\_.**

[Optional] View the video **Water Crisis** <http://www.youtube.com/watch?v=BkNY78B2Jio>

Consider ideas for producing student videos about local water issues as a culminating project. That would be completed by Lesson 11 and include a stewardship project at your River Mile Site or in the local community.

[Optional] **African Water Carrying Activity:**

1. Go outside or into the hallways and select a “water carrying” course
2. Mark one location “HOME”
3. Determine the length of the distance most appropriate for students (20 – 100 meters)
4. Mark the opposite end of the water course as “WATER SOURCE”.
5. Divide into 4-5 teams.
6. Each team is given a towel to use as a head support and a gallon of water.
7. Race the clock and try to get the most water home to your family.
8. How much heavier is the water jug being carried by the women of Tanzania



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## Human waste plagues Lake Roosevelt, other outdoor destinations

By NICHOLAS K. GERANIOS

*The Associated Press*

COULEE CITY, Grant County — The Lake Roosevelt National Recreation Area is 129 miles of watery beauty that is becoming a giant outdoor toilet, and workers are not pleased.

The National Park Service is studying ways to stop people from defecating along the shores of the lake, which is the long, thin reservoir behind Grand Coulee Dam.

"It's the greatest threat to the health and vitality of the recreation area," said Debbie Bird, superintendent of Lake Roosevelt. "A lot of people are completely disgusted by this issue."

The problem is that more than 1 million people a year visit the lake, which has relatively few bathrooms. Most of them are boaters who venture far from campgrounds. Rather than using portable toilets, which the service has required since 2000, too many visitors are doing their business right on the sandy beaches, Bird said.

The next visitor to the beach is met with a disgusting sight. And park employees are complaining about having to deal with the messes.

Lake Roosevelt is hardly unique. Human waste becomes a problem anywhere people gather in remote areas — from the tops of the Himalayas to Death Valley. Canoeists and hikers in some of the nation's most gorgeous country must carry portable toilets to pack out their poop.

But instead of a few dozen backcountry enthusiasts, Lake Roosevelt has tens of thousands of visitors every summer weekend. The lake is becoming ever more popular as the population of the Northwest grows, and facilities are not keeping up.

Even boaters who carry portable toilets to satisfy regulations often don't use them, because they don't want to clean them out, park ranger Adam Kelsey said.

"People don't like to share those things," he added.

When the portable toilet requirement for boaters first began, it was actively enforced by rangers, and a ticket carried a fine of \$125.

"We had a potty boat patrol," Kelsey recalled.

Cutbacks in staffing forced rangers to shift to other duties, and over time people began ignoring the rule, he said.

Bird recently took local officials on a tour of the lake to point out the problem, and seek solutions.

The recreation area officially gets 1.25 million visitors passing through its electronic counters each year, but many more visit the lake without being counted, Bird said.

Human waste is heavily contaminated with bacteria and poses numerous health risks, which also makes cleanup a difficult issue for park service employees. Because of the health concerns, park maintenance people cannot be routinely ordered to clean up human waste, Bird said.

Lake Roosevelt is one of the last undeveloped stretches of water in a region where many of the lakes are surrounded by private homes, said Andy Dunau, director of the Spokane-based Lake Roosevelt Forum, which advocates for protecting the quality of the area. It's one of the few places left where boaters can slide their craft onto a beach and camp anywhere they want, without paying.

That draws loads of tourists, but too many reject the old Boy Scout value of leaving an area better than they found it.

"Some people really don't get it," Dunau said.

Putting more bathrooms into the area sounds like a solution. But the cost of construction and maintenance is prohibitive, and no one wants to see restrooms everywhere, Bird said.

Stricter enforcement and issuing more tickets is not really the answer, Bird said, in part because "you never catch somebody in the act."

Lake Roosevelt only has eight park rangers, who are busy with a wide range of law enforcement duties, and can't spend all their time on this problem, she added.

The southern end of the lake is the busiest, with virtually every inhabitable spot taken during summer months, Kelsey said. Many visitors come from the Spokane area, plus Canada and the Seattle area, he said.

Not everyone agrees there is a problem. Vicki Ballard, a manager of the Kettle Falls Marina, said they don't receive many complaints about this from people who use their marina or rent the 17 houseboats.

"I've only heard about it from the Park Service," Ballard said.

You might say that, at least for now, the agency plans to paper over the problem.

The Park Service has printed up lime-green brochures with rules for dealing with human waste that will be given to all visitors.

The agency is studying whether to sell or even give away portable sanitation devices to visitors, such as "toilet in a bag" products used by mountain climbers, Bird said.

"You can throw them in a Dumpster," she said.

There is also the prospect of using volunteer boat patrols to educate visitors, she said.

A new shoreline management plan is being developed that will address issues such as building more bathrooms, Bird said.

A long-term, and perhaps more Quixotic, solution is to educate residents to value public lands.

"This has to become part of our culture," Bird said. "We have to foster an ethic of stewardship."

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**You Tube Videos** Search key words: Water Quality - Global Crisis

<b>Water for Life</b>	
URL	<a href="http://www.youtube.com/watch?v=6q9WPXz94LE">http://www.youtube.com/watch?v=6q9WPXz94LE</a>
Producer	Water Aid
Description	Focusing on Tanzania, India and Burkina Faso, the film outlines how WaterAid is changing people's lives through the provision of safe water, sanitation and hygiene education. The film highlights the importance of using community participation and low cost, appropriate technologies to ensure the sustainability of WaterAid's projects.
Length	12:00 minutes
# Views	16,366
Selection Comments	You may want to stop the video at 10:55 minutes as it becomes a request for financial support.

<b>Water Crisis</b>	
URL	<a href="http://www.youtube.com/watch?v=BkNY78B2Jio">http://www.youtube.com/watch?v=BkNY78B2Jio</a>
Producer	Global H2O
Posted Description	Kids talking about the use of fresh water and the need to recycle it.
Length	2:59 minutes
# Views	<b>27,639</b>
Selection Comments	This could be used as a model for students to make their own local version.

